Comp. & Maths. with Appls. Vol. 12A, No. 8, 945–949, 1986
Pergamon Journals Ltd. Printed in Great Britain

BOOK REPORTS

The Book Reports section is a regular feature of *Computers and Mathematics with Applications*. It is an unconventional section. The Editors decided to break with the longstanding custom of publishing either lengthy and discursive reviews of a few books, or just a brief listing of titles. Instead, we decided to publish every important material detail concerning those books submitted to us by publishers, which we judge to be of potential interest to our readers. Hence, breaking with custom, we also publish a complete table of contents for each such book, but no review of it as such. We welcome our readers' comments concerning this enterprise. Publishers should submit books intended for review to the Editor-in-Chief,

Professor Ervin Y. Rodin
Box 1040
Washington University
St Louis
MO 63130, U.S.A.

Advances in Information Science, Volume 9. Edited by Julius T. Tou. Plenum Press. 1985. 340 pages. $52.50.
Contents:

1. Data Structures and Databases in Digital Scene Analysis
2. An Overview of Database Management Technology
3. Processing of Pattern-Based Information, Part I: Inductive Inference Methods Suitable for use in Pattern Recognition and Artificial Intelligence
4. Processing of Pattern-Based Information, Part II: Description of Inductive Inference in Terms of Transition Networks
5. Automated Logic Design of MOS Networks

The Traveling Salesman Problem, A Guided Tour of Combinatorial Optimization. Edited by E. L. Lawler, J. K. Lenstra, A. H. G. Rinnooy Kan, and D. B. Shmoys. John Wiley & Sons. 1985. 465 pages. $39.95.
Contents:

1. History
2. Motivation and modeling
3. Computational complexity
4. Well-solved special cases
5. Performance guarantees for heuristics
6. Probabilistic analysis of heuristics
7. Empirical analysis of heuristics
8. Polyhedral theory
9. Polyhedral computations
10. Branch and bound methods
11. Hamiltonian Cycles
12. Vehicle routing

Chaos, Fractals, and Dynamics. Edited by P. Fischer and William R. Smith. Marcel Dekker, Inc. 1985. 280 pages. $59.75.
Contents:

1. Chaostrophes, Intermittency, and Noise
2. The Outstructure of the Lorenz Attractor
3. Chaos and Intermittency in an Endocrine System Model
4. An Index for Chaotic Solutions in Cooperative Peeling
5. Unfoldings of Degenerate Bifurcations
6. Example of an Axiom A ODE
7. Is There Chaos Without Noise?
8. Chaostrophes of Forced Van der Pol Systems

9. Numerical Solution of the Lorenz Equations
10. Some Results on Singular Delay-Differential Equations
11. Feigenbaum Functional Equations as Dynamical Systems
12. The Chaos of Dynamical Systems
13. On Network Perturbations of Electrical Circuits and Singular Perturbation of Dynamical Systems
14. On the Dynamics of Iterated Maps III: The Individual Molecules of the M-Set, Self-Similarity Properties, the Empirical n^2 Rule, and the n^2 Conjecture
15. On the Dynamics of Iterated Maps IV: The Notion of "Normalized Radical" R of the M-Set, and the Fractal Dimension of the Boundary of R
16. On the Dynamics of Iterated Maps V: Conjecture that the Boundary of the M-Set has a Fractal Dimension Equal to 2
17. On the Dynamics of Iterated Maps VI: Conjecture that Certain Sets Include Smooth Components
18. On the Dynamics of Iterated Maps VII: Domain-Filling ("Peano") Sequences of Fractal Julia Sets, and an Intuitive Rationale for the Siegel Discs

Logo: MIT Logo for the Apple (Terrapin/Krell). By Billstein, Libeskind, Lott. The Benjamin/Cummings Publishing Co., Inc. 1985. 415 pages. $26.95.

Contents:

1. Logo: A Beginning
2. Teaching the Turtle
3. Procedures with Variables
4. Recursive Procedures
5. The Coordinated Turtle
6. Using Arithmetic Operations in Procedures
7. Applications of Turtle Graphics
8. An Introduction to List Processing

Compilers: Their Design and Construction Using Pascal. By Robin Hunter. John Wiley & Sons. 1985. 273 pages. $11.45.

Contents:

1. The Compilation Process
2. Language Definition
3. Lexical Analysis
4. Context-Free Grammars and Top-Down Syntax Analysis
5. Bottom-Up Syntax Analysis
6. Embedding Actions in Syntax
7. Compiler Design
8. Symbol and Type Tables
9. Storage Allocation
10. Code Generation
11. Generation of Machine Code
12. Error Recovery and Diagnostics
13. Writing Reliable Compilers

A Practical Guide to Designing Expert Systems. By Sholom M. Weiss and Casimir A. Kulikowski. Rowman & Allanheld. 1984. 174 pages. $27.95.

Contents:

1. Expert Problem-Solving and Consultation
2. Reasoning Methods for Expert Systems
3. Historical Overview of Applications of Expert Systems
4. Designing an Expert System
5. How to Build a Practical System
6. Testing and Evaluating an Expert System
7. The Future of Expert Systems

Computer Science; An Overview. By J. Glenn Brookshear. The Benjamin/Cummings Publ. Co., Inc. 1985. 448 pages. $23.95.

Contents:

1. Data Storage
2. Data Manipulation
3. Operating Systems
4. Algorithms
5. Programming Languages
6. Software Engineering
7. Data Structures
8. File Structures
9. Database Structures
10. Artificial Intelligence
11. Theory of Computation

Office Automation: A User-Driven Method. By Don Tapscott. Plenum Press. 1982. Paperback 1985. 244 pages. $14.95.
Contents:

1. The Advent of Integrated Office Systems
2. The Problem: Technology-Driven Systems
3. Conceptual Approaches to Electronic Office Systems
4. Understanding the Office and Organization
5. Office Efficiency, Effectiveness, and Productivity
6. User-Driven Design
7. Assessing the Organization: Research Design
8. Assessing the Organization: Measurement
9. Assessing the Organization: System Design
10. Assessing the Organization: Cost-Benefit Analysis
11. Getting Going
12. From Pilot to Operational System
13. User-Driven Design, Work, and Society

Methods of Mathematics Applied to Calculus, Probability, and Statistics. By Richard W. Hamming. Prentice-Hall, Inc. 1985. 857 pages. $49.95.
Contents:

I. Algebra and Analytic Geometry
II. The Calculus of Algebraic Functions
III. The Transcendental Functions and Applications
IV. Miscellaneous Topics

Decision Making, Models and Algorithms. By Saul I. Gass. John Wiley & Sons. 1985. 412 pages. $38.00.
Contents:

I. A Framework for Decision Making
II. The Linear-Programming Model: Applications
III. Solving Linear Programming Problems: The Model and Its Algorithm
IV. Network and Related Combinatorial Problems
V. Games, Trees, and Decisions

Numerical Grid Generation. By Joe F. Thompson, Z. U. A. Warsi, and C. Wayne Mastin. Elsevier Science Publishing Co., Inc. 1985. 483 pages. $34.95.
Contents:

I. Introduction
II. Boundary-Conforming Coordinate System
III. Transformation Relations
IV. Numerical Implementation
V. Truncation Error
VI. Elliptic Generation Systems
VII. Parabolic and Hyperbolic Generation Systems
VIII. Algebraic Generation Systems
IX. Orthogonal Systems
X. Conformal Mapping
XI. Adaptive Grids

Model Building in Mathematical Programming. By H. P. Williams. John Wiley & Sons. 1985. 349 pages. $19.95.
Contents:

1. Introduction
2. Solving Mathematical Programming Models
3. Building Linear Programming Models
4. Structured Linear Programming Models
5. Applications and Special Types of Mathematical Programming Model
6. Interpreting and Using the Solution of a Linear Programming Model
7. Non-linear Models
8. Integer Programming
9. Building Integer Programming Models I
10. Building Integer Programming Models II
11. The Implementation of a Mathematical Programming System of Planning
12. The Problems
13. Formulation and Discussion of the Problems
14. Solutions to Problems

Directory of Statistical Microcomputer Software, 1985 Edition. By Wayne A. Woodward, Alan C. Elliott, and H. L. Gray. Marcel Dekker, Inc. 1985. 464 pages. $45.00.

Contents:

Supercomputer Applications. Edited By Robert W. Numrich. Plenum Press. 1985. 307 pages. $52.50.

Contents:

Solution of Partial Differential Equations on Vector and Parallel Computers. By James M. Ortega and Robert G. Voigt. SIAM. 1985. 96 pages. $9.60.

Contents:

Problems in Combinatorics and Graph Theory. By Ioan Tomescu and translated by Robert A. Melter. John Wiley & Sons. 1985. 335 pages. $33.95.

Contents:

Foundations of Business Information Systems. By Andrew Doswell. Plenum Press. 1985. 221 pages. $18.95.

Contents:

Interconnection Networks for Large-Scale Parallel Processing. By Howard J. Siegel. D. C. Heath & Co. 1985. 260 pages. $39.00.

Contents:

1. Overview
2. Interconnection Networks and Parallel-Machine Models
3. Single-Stage Network Comparisons
4. Partitioning Single-Stage Networks
5. Multistage Cube/Shuffle-Exchange Networks
6. Data Manipulator Networks

Introduction to Integral Equations with Applications. By Abdul J. Jerri. Marcel Dekker, Inc. 1985. 254 pages. $39.75.

Contents:

1. Integral Equations, Their Origin and Classification
2. Modeling of Problems as Integral Equations
3. Volterra Integral Equations
4. The Green's Function
5. Fredholm Integral Equations
6. Existence of the Solutions: Basic Fixed Point Theorems

Computer-Based Automation. Edited by Julius T. Tou. Plenum Press. 1985. 652 pages. $85.00.

Contents:

Computer-Aided Design
Robotics
Computer Vision and Image Processing
Computer-Aided Manufacturing
Local Area Networks, Databases, and Graphics

Differential Manifolds and Theoretical Physics. By W. D. Curtis and F. R. Miller. Academic Press, Inc. 1985. $69.00.

Contents:

1. Introduction
2. Classical Mechanics
3. Introduction to Differential Manifolds
4. Differential Equations on Manifolds
5. The Tangent and Cotangent Bundles
6. Covariant 2-Tensors and Metric Structures
7. Lagrangian and Hamiltonian Mechanics for Holonomic Systems
8. Tensors
9. Differential Forms
10. Integration of Differential Forms
11. The Special Theory of Relativity
12. Electromagnetic Theory
13. The Mechanics of Rigid Body Motion
14. Lie Groups
15. Geometrical Methods
16. Principal Bundles and Connections; Gauge Fields and Classical Particles
17. Quantum Effects. Line Bundles, and Holonomy Groups
18. Physical Laws for the Gauge Fields